That which passed beyond us must have been finer still. It travelled far to our south, and also fell heavily upon ships on the Pacific. I find that the finer particles do not weigh the 1/25,000 part of a grain, and the finest atoms are lighter still. By the time we returned to our encampment the grosser particles had fallen below our level, and were settling down into the valley of the Chimbo, the bottom of which was 7,000 feet beneath us, causing it to appear as if filled with thick smoke. The finer ones were still floating in the air, like a light fog, and so continued until night closed in.

In conclusion, I would say that the terms which I have employed to designate the colours which were seen are both inadequate and inexact. The most striking features of the colours which were displayed were their extraordinary strength, their extreme coarseness, and their dissimilarity from any tints or tones ever seen in the sky, even during sunrises and sunsets of exceptional brilliancy. They were unlike colours for which there are recognised terms. They commenced to be seen when the ash began to pass between the sun and ourselves, and were not seen previously. The changes from one hue to another, to which I have alluded, had obvious connection with the varying densities of the clouds of ash that passed; which, when they approached us, spread irregularly, and were sometimes thick and sometimes light. No colours were seen after the clouds of ash passed overhead and surrounded us on all sides.

I photographed my party on the summit of Chimborazo whilst the ash was commencing to fall, blackening the snow furrows; and, although the negative is as bad as might be expected, it forms an interesting souvenir of a remarkable occasion.

EDWARD WHYMPER

December 21

NOTES

THE announcement that Prof. Flower has accepted the appointment of superintendent at the Natural History Museum, vacated by the resignation of Prof. Owen, is premature, though we believe that steps are being taken to secure Prof. Flower's services for that important appointment.

WE regret to have to record the death of M. Yvon Villarceau, one of the astronomers of the Paris Observatory and a member of the Academy of Sciences for more than twenty years. M. Yvon Villarceau had been a pupil of the École Central des Arts et Manufactures, and was regarded as one of the most eminent of French mathematicians.

IT has been arranged by H.M. Trawling Commissioners that Prof. McIntosh, of the University of St. Andrews, will proceed systematically at intervals (probably once a fortnight) to the trawling grounds on the east coast of Scotland for the next six months, and undertake certain investigations concerning the grounds and their inhabitants. Each trip will probably occupy about two days. The Granton General Steam-Fishing Company's steam-trawler *Wallace*, which is fitted with all the recent appliances for such work, and is a swift and powerful steamer, will be used for the investigations, which will be at once commenced. An experienced long-line fisherman and trawler from St. Andrews (Alex. W. Brown) will accompany the professor as assistant.

THE friends of the late Mr. W. A. Forbes, the Prosector of the Zoological Society of London, have decided to collect his most important papers in a memorial volume, and the following gentlemen have been appointed to act as a committee for this purpose:—Prof. Flower, Prof. Bell, Mr. H. H. Johnston, Mr. Mivart, and Mr. Sclater. The committee find that Mr. Forbes's papers can be most suitably republished in a form similar to that adopted in the memorial volume of the memoirs and papers of Mr. Forbes's predecessor in the Prosectorial office (the late Prof. Garrod). Following the precedent of the "Garrod Memorial Committee," they propose to ask for subscriptions of one or more guineas, and to give to subscribers a copy of the work for every guinea subscribed. Mr. Sclater will edit the Forbes Memorial Volume, Mr. Johnston will prepare a biographical notice and portrait, and Mr. F. Jeffrey Bell, 5, Radnor Place, Gloucester Square, W., will act as Secretary and Treasurer.

THE appointment of a Japanese student as assistant to the Professor of Anatomy at Berlin has been approved by the Minister of Public Worship.

MR. FRANCIS ELGAR, Consulting Naval Architect and Engineer in London, has been unanimously elected by the Glasgow University Court to the John Elder Chair of Naval Architecture.

AN expedition is at last being organised under the auspices of the British Association to proceed to Mount Kilimanjaro, the snow-clad peak of Eastern Equatorial Africa. The party will be under the charge of Mr. H. H. Johnston, who has recently returned from the Congo. The party will leave England at the beginning of March.

HEAVY indeed is the burden of educating laid upon the Southern States! With only one half at school of a population the illiterate proportion of which, among both whites and negroes, is increasing, and in some States this increase of illiteracy greater among the whites than among the negroes; with the negro, the non-taxpaying element, increasing fastest, notwithstanding white immigration; with trades destroyed, and property in consequence reduced in value 40 per cent., and in some States still falling in value; with the franchise, nevertheless, given to this increasing body of ignorance; evil indeed may be the result to a republic if the whole Union does not assist to correct it. Emancipation was a national act, and the nation ought to meet the inevitable consequence. So urges Dr. Haygood, in the United States educational circulars referred to last week, with the warning that no white men will agree for long to be voted down by a majority of illiterate blacks and whites.

ON Thursday, at 9.21 p.m., a shock of earthquake was felt in Fünfkirchen, a town in the south of Hungary, not far from the confluence of the Danube and Drave. The shock lasted two seconds, and was accompanied by a loud underground rolling noise. At the same time a similar earthquake and noise occurred at Barcs, a place to the south-east of the former, on the banks of the River Drave. Both shocks moved northwards. An earthquake shock was also felt at Lisbon at 1.30 a.m. on the 22nd inst., but did not excite much notice. A second shock, which lasted twelve seconds, occurred two hours later; being accompanied by subterranean rumblings, it awoke the entire population, and caused a panic among the inhabitants in the narrow streets. The seismic wave passed from northwest to south-east.

THE fourteenth Annual Report of the Botanic Garden Board of New Zealand (1883) contains valuable information as to the ravages of certain scale insects (*Coccidæ*) in the colony. They appear to be principally of two kinds: one is an *Icerya*, nearly related to the sugar-cane pest of Mauritius, &c., the other a *Mytilaspis* allied to the common "apple scale" (*M. pomorum*). The *Icerya* is called the "wattle blight," but appears by no means to confine its ravages to the wattle trees. According to Mr. Maskell, it is the *Mytilaspis* that is the more serious, for it overruns in countless millions all kinds of fruit and other trees (fortunately it appears to be enormously infested and destroyed by a parasite). With regard to remedies, there is a little vagueness in the Report, owing apparently to the confusion of the two insects. The first portion speaks only of the *Icerya*, and states that Mr. Engle of Nelson had completely destroyed it by the

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application of kerosene and fish oil. Subsequently Mr. Maskell, dealing with the *two* species, says that a mixture of kerosene and linseed oil (one-third or one-fourth of the former) as recommended by Mr. Comstock in America, had been perfectly successful so far as regards the *Mytilaspis*, which he does not regard as serious in its probable effect upon wattles (*Acacia*), but very serious with respect to fruit and other trees. On the other hand, he considers all remedies useless against the *Icerya* of the wattle other than the radical one of cutting down and destroying the affected trees. No indication is given, however, of the use of a force-pump in distributing the kerosene; if this were used, the remedial agent might be distributed to a greater height than would be possible by mere hand application, and moreover it might be made to penetrate dense hedges, &c., the interior of which it would be impossible to drench by hand labour. The improved form of application, as a "kerosene emulsion," recommended by Prof. Riley and Mr. Hubbard, did not appear to be known in New Zealand at the time the Report was drawn up. Any way it is satisfactory to hear that the *judicious* application of kerosene will certainly destroy scale insects without necessarily damaging the plants.

The same Report speaks very hopefully of the ultimate success of attempts to cultivate hops in the province of Wellington; in Nelson success has been already secured. The great drawback is the expense of providing the necessary *poles*, and much stress is laid upon the necessity for cultivating oak, ash, birch, and species of *Eucalyptus* for that purpose. Of the indigenous poles, those of *Myrsine urvillei* are said to be the most durable.

The additions to the Zoological Society's Gardens during the past week include a Toque Monkey (*Macacus pileatus* ♀) from Ceylon, presented by Mr. J. H. Barker; a Macaque Monkey (*Macacus cynomolgus* ♂) from India, presented by Mr. Douglas; a Common Marmoset (*Hapale jacchus*) from Brazil, presented by Mrs. Archer; a Moorhen (*Gallinula chloropus*), British, presented by Mr. T. E. Gunn; a Gannet (*Sula bassana*), British, presented by Mr. J. C. Baxter; two St. Thomas's Conures (*Conurus xantholæmas*) from St. Thomas, West Indies, presented by Mr. C. Wallis Enslie; two Fringed-lipped Lampreys (*Petromyzon branchialis*), British, presented by the Rev. F. T. Wethered; a Pied Wagtail (*Motacilla lugubris*), British; a Slaty Egret (*Ardea gularis*), European, purchased.

INTERNATIONAL POLAR OBSERVATORIES

I beg to inclose you an extract from a letter just received from Prof. Wild, President of the International Polar Committee, and which gives information as to the several expeditions which conducted observations in the circumpolar regions during the twelve months ending August 31, 1883.

Robert H. Scott

"I take this opportunity of stating concisely what I have hitherto learnt as to the present condition or the return of the various expeditions.

"1. The United States—Point Barrow.—The Expedition was to have returned in the summer of 1883. Definite information as to its return has not yet been received.[1]

"2. England and Canada—Fort Rae, on the Great Slave Lake.—According to a communication received from Mr. Scott, dated November 21 last, the Expedition has safely returned to England.

"3. United States—Lady Franklin Bay.—The attempts to relieve the Expedition this summer by ship have, like those of last year, failed owing to the unfavourable condition of the ice. (Extract from newspapers.)

"4. Denmark—Godhavn, in Greenland.—According to a communication from Captain Hoffmeyer, dated December 8, the Expedition has safely returned to Copenhagen with a rich store of observations.

"5. Germany—Cumberland Sound (Davis Strait).—According to a communication received from Dr. Neumayer, dated November 1, the Expedition has safely returned to Hamburg, having completed its task in a satisfactory manner.

"6. Count Wilczek's Station (Austria)—Jan Mayen, in Marymuss Bay.—The Expedition has safely returned to Vienna, having completely carried out its programme. A short report of its operations has been published by M. von Wohlgemuth, the Chief of the Expedition.

"7. Sweden—Spitzbergen (Cape Thordsen, in the Ice Fjord).—Dr. Rubenson states that the Expedition has safely returned to Stockholm.

"8. Norway—Bossekop, near Alten.—From a letter from Prof. Mohn, dated September 7, the Expedition stopped work on August 31, having completely carried out its programme, and on September 17, according to a report in *Naturen* (October, 1883) it safely returned to Christiania.

"9. Finland—Sodankyla.—The Expedition completed its task for the first year, but, according to a communication from Prof. Lemström, dated August 5, the observations will be continued another year, as the Government of Finland has provided the funds for the purpose.

"10. Russia—Nova Zembla (Möller Bay).—The Expedition returned to St. Petersburg in October with a rich store of observations.

"11. Holland—The Kara Sea.—The Expedition could not reach its original place of destination, Port Dickson, but was surrounded by ice in the Kara Sea, and has, according to a letter from Prof. Buys Ballot, dated October 1, safely returned to Utrecht, having under the circumstances only imperfectly carried out its programme.

"12. Russia—Mouth of the Lena (Sagastyr).—The Expedition, which suffered from storms during the passage down the Lena, was not properly established until October 20, 1882; from that date it has been able to carry out all the work laid down in the programme. It will continue its observations for another winter.

"13. France—Cape Horn (Orange Bay, Terra del Fuego).—According to a report from Prof. Mascart, dated November 17, the Expedition has returned safely to Paris, with a rich store of materials.

"14. Germany—The Island of South Georgia (Moltke Harbour).—This Expedition has also safely returned, according to a communication from Dr. Neumayer.

"Of the fourteen Expeditions, therefore, three will continue their observations for about another year (Lady Franklin Bay, Sodankyla, and Lena delta); the continuance of a fourth (Point Barrow) is at present unknown, the other ten have safely returned."

MOVEMENTS OF THE EARTH[1]

III.—*Rotation of the Earth*

The several ideas concerning the movements of the earth which were introduced in the last lecture will in the present one have to be dealt with in greater detail.

It was then agreed that if the whole expanse of the heavens were to travel with a perfectly equable motion in one direction, such a motion for instance as would result from all the stars being fixed to a solid transparent substance like those crystal spheres that the ancients really believed to exist; or if, on the other hand, the earth herself, instead of being free to turn as she listed with varying velocity in any direction, really went with perfect constancy in the direction opposite to the apparent motion of the stars, the visible effects would be the same in both cases, so that an appeal to our eyes would not suffice to enable us to say whether the earth moved or whether she remained at rest while the celestial sphere revolved around her.

Under these circumstances what is to be done? It has been seen how, both with regard to the measurement of space and the measurement of time for astronomical purposes, those interested in the physics and beauties of the various classes of celestial bodies outside our own earth have picked and chosen now one bit of physical science and now another to help them in their inquiries; and with regard to this very important question, "Does the earth move or is she at rest?" we shall see how very beautifully and perfectly the question has been answered by the application of certain mechanical principles.

The majority of people, I suppose, have some acquaintance, however slight, with machinery—with steam engines for in-

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[1] We believe this party arrived at San Francisco some weeks ago.—Ed.

[1] Continued from p. 69.

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